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ABSTRACT

Several methodological issues related to second language acquisition research are considered, and a two-part study is discussed that addresses issues related to data collection, i.e., how and how frequent, and data analysis, i.e., the appropriateness of the statistical tools, the justification of inferences and the comparability of results based on different methods. The study, part of a larger 10-month longitudinal investigation of sequences in second language acquisition, sought to answer two major questions: whether the morpheme order obtained using an elicitation instrument (the Bilingual Syntax Measure) resembles the order of morphemes obtained from spontaneously collected second language acquisition speech data, and whether the cross-sectional and longitudinal research findings in second language acquisition research are comparable. In part on of the study, a one-hour taped speech protocol for each of six untutored Spanish speakers learning English was examined. In the second part of the study, the cross-sectional order of one of the subjects was compared with his order of morpheme acquisition once a month over the ten months of the study. A great deal of variability was found in the data, and the findings raise serious questions about the validity of cross-sectional studies of second language acquisition, at least in the area of morpheme acquisition. (SW)

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METHODS AND MORPHEMES IN SECOND LANGUAGE ACQUISITION RESEARCH

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There have been an increasing number of second language acquisition studies in the past several years. While a few of these have been detailed longitudinal studies of a variety of linguistic features and functions, many others have been cross-sectional analyses of the relative percent accuracy of 8-11 morphemes. Furthermore, many of these cross-sectional studies have obtained data through the use of an elicitation instrument called the Bilingual Syntax Measure (BSM) developed by Burt, Dulay and Hernandez-Chavez (1975).

This paper will consider several methodological issues related to second language acquisition research. While my study has 2 parts (the cross-sectional and the longitudinal analyses) the issues which I will address are related to both data collection, i.e., how and how frequent, and data analysis, i.e., the appropriateness of the statistical tools, the justification of inferences and the comparability of results based on different methods.

Much of second language (L_2) acquisition research methodology and areas of interest have followed the L_1 acquisition research precedents. Two L_1 studies in particular, have served as models. Brown's (1973) detailed longitudinal study of the acquisition of English as a first language by 3 children demonstrated an invariant order of acquisition for 14 morphemes. This order was observed over time and was followed by all 3 children. Subsequently, the de Villiers (1973) conducted a cross-sectional investigation of 21 children and, using 2 different analysis methods, found an ordering of morphemes which correlated highly with Brown's (Method I, rho = .84; Method II, rho = .78, $p < .01$).

Because of these high correlations it has been assumed that cross-sectional studies of second language performance would yield reliable information about the L_2 acquisition process. It has never been demonstrated that L_2 acquisition follows the same kind of developmental learning curve that L_1 learning does. Nor have L_2 acquisition researchers yet found some measure to hold constant or a means of equating the subjects in their samples. Brown could observe the acquisition of the 14 morphemes over time and determine when they were acquired with respect to MLU level. The de Villiers could obtain a sample of subjects representing the span of MLU ranges and order the morphemes (in the Method I analysis) in terms of the MLU level of the children. L_2 acquisition research has no metric comparable to MLU; and MLU is not appropriate after age 4 or 5. We don't know if age of initial exposure, number of months of exposure, amount of instruction, age ... or some other variable should be held constant. We haven't gone in

and systematically examined a slice in the continuum because:

1. we don't have any means of identifying the slice, and
2. we don't know very much about the nature of that continuum.

While L_1 acquisition in young children appears to develop in concert with cognitive and social development and linguistic input, to what is L_2 acquisition related? Several current theories suggest a variety of factors which are probably related to the process of second language acquisition[1] but none of these factors helps to determine how we can systematically examine the acquisition process. As a result numerous cross-sectional studies have trusted these theoretical considerations to chance by going in blindly somewhere--anywhere--to look ostensibly at L_2 'acquisition'.

Of course we had to start digging somewhere. What disturbs me, and what I shall report here, is the "not-knowing-where-we've-been-digging" and the way in which we've been conducting our 'dig'.

The most often quoted cross-sectional L_2 acquisition studies are the 1973 and 1974 studies of Dulay and Burt. Based on results from these studies, using the Bilingual Syntax Measure (BSM) to elicit speech, Dulay and Burt have claimed that for ESL learners there is an invariant order of acquisition of the morphemes which the BSM regularly elicits. The 1973 study contained three sub-samples of Spanish-speaking 5-8 year olds, and the 1974 study included 55 Spanish-speaking and 60 Chinese-speaking children. The order of morphemes for the three 1973 groups correlated highly with each other, as did the Chinese and Spanish groups in 1974. The morpheme ordering obtained by Dulay and Burt did not correlate with the de Villiers' order for L_1 children (1973: rho = .59 n.s.; 1974: rho = .19 n.s.[2]). This, Dulay and Burt explain, is due to the more advanced cognitive development of the 5-8 year olds, since L_1 children are still developing cognitively during the course of language acquisition.

Bailey, Madden and Krashen (1974) conducted a similar cross-sectional study of morphemes using the BSM on 72 adult ESL students. They found that their rank ordering of morphemes correlated with Dulay and Burts' (1973) samples' orders. (See Table I.) They conclude, based on their correlations, that "children and adults use common strategies and process linguistic data in fundamentally similar ways (p. 235)." Bailey et al.'s order of morphemes, like Dulay and Burts,' did not correlate with the de Villiers' cross-sectional order for L_1 children (rho = .57, n.s.).

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[1] Among the more recent factors suggested are: attitude and motivation and their interaction with social distance (Schumann, 1975); the possible effects of cognitive development (Formal Operations) on adults, and earlier cognitive developmental stages in determining an optimal time for children to learn a second language (Rosansky, 1975 and Krashen, 1975); creative construction (Brown, 1973 and Dulay and Burt, 1974a); and frequency of occurrence in the input to the learner which is again being seriously suggested as an explanatory factor (Cazden, Cancino, Rosansky and Schumann, 1975 and Larsen, 1975). This list, by no means exhaustive, suggests the number and kinds of factors involved in L_2 acquisition. Undoubtedly these are interrelated as well. Instructive as these considerations may be, they do not help to determine an appropriate cross-sectional point for research purposes.

[2] n.s.: non-significant. All correlations with a $p > .05$ are considered here to be non-significant. Correlations of $p < .05$ and smaller, are taken as significant.

These studies are based on speech data elicited via the BSM. While there are several versions of this test, basically it consists of 6 or 7 cartoon pictures and a series of questions administered by the experimenter or teacher. In all, the test allows for 30-40 scorable subject utterances. It also includes several preliminary questions designed to ensure vocabulary comprehension.

Table I

Spearman and Pearson Correlations between Bailey, Madden and Krashen's RSM order of morphemes and the orders obtained by Dulay and Burt (1973) and the de Villiers (1973) for L_1 children

	D&B(73)Sacr.	D&B(73)San Y.	D&B(73)Harlem	deV&11(73)L_1
BMK_r	.89[a]	.97[a]	.60	
rho	.91[a]	.94[a]	.88[a]	.57

(a = p<.01; b = p<.05, for all tables)

After collecting the speech data the procedure is to code the subjects' utterances for the number of absent, partially correct, or fully formed morphemes supplied in obligatory context. This tabulation can be done by the Group Score (GS) or Group Means (GM) method. The GS method entails adding up all of the subjects' obligatory occasions for each morpheme to obtain a pooled denominator, and following the same procedure for the number of times the morpheme was supplied when required (or partially supplied for partial credit) to form the numerator. A percent is computed and multiplied by 100 yielding the Group Score. The GM is obtained by taking each subject's percent, eliminating those individuals with 2 or fewer obligatory occasions for that morpheme and computing the mean of all remaining subjects' scores. The morphemes are then listed in decreasing order in terms of Group Scores or Group Means and assigned rank values 1, 2, 3 etc. (from high to low). In order to compare the morpheme order of one sample with that of another, the rank orders are then compared.

The rank orders are simply a ranking of the morphemes with respect to their relative percent correct in obligatory context, averaged for a group of individuals with sometimes nothing more in common than a range of ages and the fact that they're learning English as a second language in this country, for varying amounts of time, with variable amounts of exposure and with varying amounts of instruction. Based on this information Dulay and Burt claim that their rank ordering of morphemes (which correlates among the sub-samples of the same study) represents an invariant order of acquisition. Bailey, Madden and Krashen are more cautious; they refer to the ordering as a difficulty order of morphemes.

Larsen (1975), on the other hand, using the BSM along with four other measures in a cross-sectional study of the ESL acquisition of 24 adults, suggests that the most appropriate description of these rank orders is an "accuracy order for a specific task (1975b, p. 2)." Larsen's study reveals that "even though there was language group by task concordance on 4 of the

tasks, Spearman rho's between language groups were often not significant with the exception of the Bilingual Syntax Measure ... (1975a, p. 9)." Although the morpheme ordering she obtained using the BSM correlates with Dulay and Burt's (1974 GS) order (Phase I; rho = .87, $p < .01$; Phase II: rho = .72, $p < .05$), only one other task, an imitation task correlates with Dulay and Burt's order. She concludes that until we can cross-validate the BSM-generated orders with sequences obtained using other instruments that:

> ...we cannot be sure that we are getting a ... morpheme difficulty ordering - and certainly it is not clear that we are getting a general acquisition order. (1975b, p. 88)

Like Larsen, I am concerned lest we believe that we have discovered an invariant acquisition sequence for all L_2 learners based on the rank ordering of the relative accuracy of a few morphemes.[3] Beyond the question of whether rank-orderings can be translated into acquisition sequences (a developmental phenomenon after all), or whether the cross-sectional ordering of morphemes in fact looks like what occurs longitudinally over time (the question taken up in the second part of my study), there is still the question of elicited speech data; does it or doesn't it affect the subsequent results? This is an important question particularly with respect to the BSM, as a close investigation reveals some anomalies in the results obtained from its use.

Although Dulay and Burt report significant correlations within their 1973 and 1974 studies respectively, the correlations across the two studies are less clear. For example, while the 1973 Sacramento sample's order correlates with the 1974 Spanish-speaking sample (rho = .67, $p < .05$), it correlates neither with the 1974 Chinese-speaking sample nor with the 1974 study as a whole. These correlations are summarized in Table II. As I have observed elsewhere, if this inconsistency is due to the changes in the BSM between 1973 and 1974, we have a problem of reliability. It may be that different methods or different tasks are either not measuring the same thing or are in some way affecting the outcome.

Table II

Spearman Correlations between Dulay and Burt's 1973 and 1974 Studies

	D&B(74)GS	D&B(74)Sp.GS	D&B(74)Ch.GS
D&B(73) Sacr. GS	.61	.67[b]	.57

[3] ... when required. Hakuta's (1975) longitudinal study, for example, also considers how often the morphemes are supplied when optional, and when not required.

A second problem with results obtained using the BSM is a matter of validity. We would expect that if the BSM were used to elicit speech data from first language learning children, that the order of morphemes obtained would resemble the already established L_1 order of morphemes. In an unpublished pilot project Porter (1975), using the BSM, gathered speech data from 11 L_1 children age 27-48 months. The order he obtained did not correlate with the de Villiers' L_1 order and in fact his Group Score morpheme order actually correlated with that of Dulay and Burt (1974). These correlations are summarized in Table III.

Table III

Spearman Correlation for Porter's L_1 morpheme order with Dulay and Burt's (1974) and the de Villiers' (1973) L_1 order

	D&B(74)GS	D&B(74)GM	de Villiers
Porter(GS)	.80[b]		
Porter(GM)		.68	.67

Rosansky Study

In light of the issues raised thus far, my study--part of a larger 10 month longitudinal investigation of sequences in second language acquisition (Cazden, Cancino, Rosansky and Schumann, 1975)--sought to answer two major questions:

1. Whether the morpheme order obtained using an elicitation instrument (the BSM) resembles the order of morphemes obtained from spontaneously collected second language acquisition speech data, and
2. Whether the cross-sectional and longitudinal research findings in second language acquisition research are comparable.

Part I

For the first part of this study I examined a one hour taped speech protocol for each of six untutored Spanish speakers learning English. The sample consisted of two children, two adolescents and two adults. All had been in this country about three months when the study began. Both the experimenter and a bilingual transcriber were present at each of the twice-monthly sessions. For purposes of the cross-sectional analysis all of the one hour protocols were examined after ten months of exposure to English.[4] The transcripts were scored for morphemes following Dulay and Curt's methodology, and both Group Scores and Group Means were tabulated.

My hypothesis was that the rank order of morphemes derived from my spontaneous speech data would not correlate with Dulay and Burt's BSM-generated order. My resulting correlations are summarized in Table IV. My morpheme order did correlate with Dulay and Burt's as well as with Bailey, Madden and Krashen's and with Larsen's BSM orders. My order also correlated however, with the de Villiers' L_1 order!

[4]Marta, one of the children, was sampled after only 9 months in this country, as she returned to Puerto Rico at that time.

Table IV

Spearman Correlations for the Cross-Sectional Rank Order of Morphemes based on Group Means (RGM) and Group Scores (RGS) with Dulay and Burt, the de Villiers, Bailey et al., and Larsen

RGM	D&B (74) GM .83[a]			de Villiers (73) .67[b]	
	D&B (73) GS	D&B (74) GS	DL I	DL II	Bailey et al
RGS	.76[b]	.76[b]	.75[a]	.77[a]	.71[b]

Prompted by the contradiction in these correlations, I re-examined my own data and found a great deal of individual variability. Evidence of this variability can be seen on a number of different levels. By levels I mean the various statistical treatments of the original data. Each level tends to obscure a little more information. At the level of individual scores the variability can be seen with the eye. These individual scores are displayed in Table V. From individual scores, Group Means and Group Scores are computed; and finally ranks are assigned to the grouped scores.

Table V

Accuracy on 11 Morphemes in Obligatory Context for Six Spanish Speakers: Raw Ratios, Individual Scores, Group Scores and Group Means

Morphemes	Marta		Cheo		Juan		Jorge		Alberto		Dolores		RGS	RGM
Ing	106/108	(98)	40/42	(95)	30/30	(100)	78/82	(95)	6/10	(60)	106/110	(96)	96	91
Sh.Pl.	50/50	(100)	42/52	(81)	132/134	(99)	26/28	(93)	178/230	(77)	260/274	(95)	90	91
Pro.Case	154/164	(95)	93/108	(86)	115/120	(97)	184/186	(99)	106/164	(65)	586/602	(97)	92	90
Article	259/268	(93)	228/242	(94)	176/188	(94)	144/154	(94)	268/364	(57)	386/418	(92)	89	89
Copula	106/116	(91)	102/114	(89)	98/102	(96)	94/96	(98)	193/298	(65)	376/386	(97)	87	88
Aux.	30/30	(100)	8/16	(50)	8/8	(100)	51/52	(98)	4/8	(50)	111/116	(96)	92	82
Poss.	10/14	(71)	4/4	(100)	0/2	(0)	4/4	(100)	8/8	(100)	6/12	(50)	73	74
Past Irr.	38/44	(86)	15/28	(54)	56/60	(93)	16/20	(80)	36/52	(69)	196/346	(57)	65	73
Long Pl.	12/12	(100)			4/4	(100)	6/8	(75)	0/6	(0)	10/10	(100)	80	69
Past Reg.	14/16	(88)			28/30	(93)	2/4	(50)	1/20	(5)	37/88	(65)	63	64
3rd Reg.	30/40	(75)	1/50	(2)	16/16	(100)	2/18	(11)	4/34	(12)	74/100	(74)	51	45

At the level of ranks I tested the data for variability. A Kendall Correlation of Concordance W reveals that the individuals' ranks on the morphemes when compared with each other as a group did not correlate significantly ($W = .27$; $\chi^2 = 16.2$, n.s.). The individual orders of subjects paired by age (i.e. the two children, two adolescents and two adults) also do not appear to be similar. These correlations are summarized in Table VI. As can be seen two of the three pairs are significantly correlated--negatively!

Table VI

Spearman Correlations of 6 Spanish speaking subjects paired by age (ranked according to (RGM) Group Means)

$Child_1$:$Child_2$	$Adolescent_1$:$Adolescent_2$	$Adult_1$:$Adult_2$
-.13	-.50[b]	-.75[a]

At the GM level the variability can be determined by computing the standard deviations and variances. The GM, standard deviations and variances for each morpheme are displayed in Table VII. In many cases the standard deviations ($\hat{s}$) are large with respect to the GM. In an earlier paper

Table VII

Rosansky (Cross-sectional) Group Means, Standard Deviations, and Variance

	Ing	ProCase	Aux	Sh. Pl.	Art.	Copula	L. Pl.	Poss.	PastI.	Past R.	3rd Reg.
N	6	6	6	6	6	6	5	6	6	5	6
$\bar{X}$	91	90	82	91	89	88	69	74	73	64	45
$\hat{s}$	15.15	13	25.09	9.6	14.28	12.52	49.59	40.22	15.82	37.25	40.35
s^2	229.60	169	629.60	92.2	204.00	156.80	2460.00	1617.00	250.20	1388.00	1627.80
Rank	1.5	3	6	1.5	4	5	9	7	8	10	11

(Rosansky, 1976a) I have underscored the need for researchers to publish their raw data, mean scores and variance. Since then I have had the opportunity to compute the variance for both the Bailey et al. L_2 study and the de Villiers' L_1 study. This information is displayed in Tables VIII a and VIII b. In my earlier paper I pointed out that my variance might be due to the small size of the sample and that larger samples might exhibit less variability with respect to the grouped scores. Bailey et al's study was based on 72 subjects and the de Villiers' on 21. As can be seen many of the means exhibit large variance, with standard deviations ($\hat{s}$) occasionally approaching the value of the mean itself.

Table VIIIa

Bailey, Madden and Krashen (1974) Group Means, Standard Deviations and Variance

	Ing	Pl.	Past I.	Poss.	Art.	3rd S	Cop.	Aux.
N	71	72	68	69	72	68	72	69
$\bar{X}$	83.7	79.34	54.48	38.28	79.33	42.01	83.87	68.63
$\hat{s}$	24	23.07	39.77	36.38	22.71	35.22	18.60	34.74
s^2	568.5	525.00	1558.66	1304.46	508.91	1222.48	341.38	1189.41
Ranks	2	3	6	8	4	7	1	5

Table VIIIb

de Villiers' (1973) Group Means, Standard Deviation, and Variance

	Ing	Pl.	Past I.	Poss.	Art.	3rd s	Cop.	Aux.
N	14	21	8	21	4	20	14	5
$\bar{X}$	94.6	87.62	70	60.19	50	55.7	44.73	41.98
$\hat{s}$	11.33	21.12	37.35	34.51	57.73	36.86	38.43	26.16
$\hat{s}^2$	11.29	425.15	1221.15	1134.49	2500.00	1290.38	1373.03	467.28
Rank	1	2	3	4	6	5	7	8

With variance this large one must ask whether the sample means in these studies (my own included), are reasonable estimates of the population means (i.e. are we accurately describing the language performance of the population?). This is a serious methodological question for second language acquisition to resolve.

While my grouped rank ordering of means (based on spontaneous speech data) statistically correlates with the BSM—generated order of morphemes, given the extent of individual variability about these means in my data, these correlations can hardly be meaningfully interpreted. Thus the entire rank order is subject to doubt.

Grouped variability aside, another analysis of my data directly addresses the issue of the comparability of morpheme rank orders based on spontaneous versus BSM-elicited speech data. For the two adolescents, the BSM was also administered after 10 months of exposure. For each boy a comparison of the BSM-based and spontaneous speech-based morpheme rank orders reveals no significant correlations. The two boys' orders compared with each other on spontaneous speech are negatively correlated (rho = -.50), but their BSM-based orders correlate significantly with each other (rho = .68, $p < .05$).

The discrepancy between the boys on the BSM vs. spontaneous orders is striking, particularly since one ordering yields a positive and the other, a negative correlation. Even more striking is the non-correlation of the BSM-generated and spontaneous speech-based morpheme orders for the same individual at the same point in time. Since this finding is based on only two individuals, we must be cautious in generalizing too far beyond the data at hand. Nonetheless, it raises the question of whether the use of the BSM might not be somehow affecting the outcome--at least with respect to the rank ordering of morphemes. Possible reasons for this might lie in the format of the test itself:

1. The preliminary questions administered to ensure vocabulary comprehension may be providing models for some but not all of the morphemes.
2. The limited nature of the questions with respect to the content of the pictures may systematically bias opportunities for some but not all of the morphemes.
3. The sheer limitation of the number of utterances may restrict the number of opportunities for the subject to create a sufficient number of obligatory contexts for some of the morphemes.

Part II

The second part of this study was designed to determine whether cross-sectional rank order of morpheme accuracy correlates with the longitudinally derived order of acquisition. I took the cross-sectional order of one of the adolescents, Jorge, and compared it with his order of morpheme acquisition over the entire 10 months of the study, sampled for purposes here, once monthly. While the morpheme scoring is identical to the cross-sectional analysis, the determination of the order of acquisition is different in a longitudinal study. Each transcript is scored for morphemes and an individual score is computed for each morpheme at each one month interval. (e.g. A ratio of 20 -ing's supplied correctly in 25 obligatory occasions yields a score of 80 (80%).) At the outset of my study I determined an 'acquisition point' using a modification of Brown's (1973) criteria for L_1 acquisition. If a morpheme score attains 80 or higher for three consecutive samples in which there are more than two obligatory occasions for that morpheme, it is 'acquired'.

Table IX diplays the raw ratios and scores for the longitudinal analysis. The circles indicate at which tape session each morpheme was acquired. Note that after Tape #20, which represents 12 months of exposure to English, Jorge has only acquired six morphemes.

Table IX

Morpheme Scores and Raw Ratios Computed at One-Month Intervals of Spontaneous Speech

	Jorge									
Morpheme	1	3	5	7	9	11	13	16	18	20
Copula	74	100	72	(90)	85	81	100	98	94	100
	68/92	60/60	82/114	52/58	128/150	116/144	48/48	128/130	116/124	86/86
*	89	100	83	100	91	83	100	98	99	100
	66/74	56/56	66/80	42/42	120/132	110/132	44/44	94/96	83/84	62/62
Article	66	(86)	80	84	84	90	88	94	97	92
	54/82	74/86	240/300	156/184	187/222	240/268	56/64	144/154	116/120	172/186
Sh. Pl.	25	(92)	93	87	87	87	90	93	78	93
	6/24	24/26	86/92	130/150	96/110	144/166	18/20	26/28	36/46	86/92
Pro Case	62	49	77	88	79	(94)	95	99	95	98
	71/114	60/122	324/422	385/436	292/368	726/772	242/256	256/262	510/536	514/524
*	72	50	77	87	91	97	100	99	96	99
	43/60	4/8	68/88	103/118	64/70	268/276	90/90	184/186	218/226	214/216
L. Pl.	100	0	0	0	80	100	100	75	0	75
	4/4	0/2	0/4	0/2	8/10	10/10	4/4	6/8	0/2	12/16
Ing	71	60	0	60	67	63	67	(95)	100	100
	10/14	6/10	0/4	6/10	8/12	10/16	4/6	78/82	24/24	58/58
Aux-be	100	33	-	33	50	28	61	(93)	92	100
	6/6	2/6	-	8/24	12/24	22/80	22/36	71/76	44/48	82/82
*	100	-	-	-	100	18	57	98	100	100
	4/4	-	-	-	4/4	6/34	16/28	51/52	18/18	18/18
Past I.	0	100	14	16	47	35	33	80	71	67
	0/4	2/2	8/58	12/74	14/30	30/86	6/18	16/20	40/56	29/44
Poss.	75	-	38	67	50	83	45	100	0	75
	6/8	-	3/8	4/6	2/4	5/6	10/22	4/4	0/4	6/8
*	50	-	0	67	50	67	45	100	0	75
	4/8	-	0/8	4/6	2/4	4/6	10/22	4/4	0/4	6/8
Past R.	-	-	33	33	40	35	33	50	78	67
	-	-	2/6	6/18	8/20	6/18	2/6	2/4	14/18	8/12
3rd S.	0	50	6	0	47	23	40	11	30	50
	0/8	2/4	2/34	0/32	14/30	18/78	4/10	2/18	16/20	14/28

*Dulay & Burt categories

Table IX also reveals slightly different scores for the "Dulay and Burt categories" (Method II) for several of the morphemes. These categories include a more limited subset of some of the morphemes. The contractable copula and aux (be) include only 3rd person singular present and past; my category includes all persons: present, past and future. ProCase is limited by Dulay and Burt to 3rd person (he-him, she-her and they-them), while mine also includes I-me, we-us and it. Although my morpheme categories (Method I) provide greater depth and a larger number of obligatory contexts, the longitudinal orders based on the two methods correlate significantly (rho = .83, $p < .05$).

The longitudinal rank orders are summarized in Table X, and Jorge's cross-sectional order is displayed in Table XI. The Method I longitudinal order attains a rho = -.58 (n.s.) with respect to the cross-sectional order; Method II attains a rho = -.22 (n.s.). Thus the cross-sectionally obtained and longitudinally derived rank orders of the morphemes for the same individual do not correlate.

Table X

Longitudinal Rank Ordering for Jorge of 11 Morphemes from 3 - 12 Months of Exposure*

Method I (Rosansky categories)			Method II (Dulay & Burt categories)		
Morpheme	Rank	Tape #	Morpheme	Rank	Tape #
Article	1.5	3	Article	2.5	3
Sh. Pl.	1.5	3	Sh. Pl.	2.5	3
Copula	3	7	Copula	1	1
Pro Case	4	11	Pro Case	4	7
Ing	5.5	16	Ing	5.5	16
Aux (be)	5.5	16	Aux (be)	5.5	16
L. Pl. Past I. Poss. Past R. 3rd Reg.	?	?		?	?

* 80% correct; 3 consecutive samples with greater than 2 obligatory occaisions

Table XI

Cross-sectional Rank Order of Morphemes for Jorge (Tape #16)

Morpheme	Rank	Score
Article	5	94
Sh. Pl	6	93
Copula	2.5	98
Pro Case	1	99
Ing	4	95
Aux (be)	2.5	98
L. Pl.	7	75

2. For two subjects, the order of morphemes obtained based on the BSM vs. spontaneous speech did not correlate for the same person at the same point in time.

3. My data contained large amounts of individual variability both in terms of the subjects' rank orders, and with respect to the Group Means.

4. For other cross-sectional studies where the raw data has been made available, (Bailey et al, 1974 and de Villiers, 1973) large variance around the GM was also found.

Part II

1. The cross-sectionally based and longitudinally derived rank orders of the morphemes for the same individual do not correlate.

2. The rank orders of the morphemes from month to month appear to fluctuate and do not resemble the longitudinal order.

Discussion

The implications of these results are far-reaching. This study raises serious questions about the validity of cross-sectional studies of second language acquisition--at least in the area of morpheme acquisition.

- It could be argued that since the other cross-sectional studies reported have a great deal of variability in the data, this might affect the ranking in comparison to longitudinal rankings; however, the non-correlation I have reported here between cross-sectional and longitudinal orders is based on the same individual. There is no group variability to account for.
- We might argue that this was a particularly non-representative cross-sectional slice to have compared with the longitudinal order; but Table XII reveals that none of the one-month slices is any more representative of the whole picture.
- It may be that we are comparing 'apples and oranges' since cross-sectional studies really only tell us the relative percent correct at some point in time, while the longitudinal data reveal an order of acquisition; but the longitudinal order is also based on the relative percent correct of the morphemes.
- It may be that this individual's speech data is more variable than other learners'; this will only be determined when more such longitudinal studies have been conducted.

While the current cross-sectional literature has offered valuable insights into certain problems, my longitudinal analysis suggests that we exercise greater caution in evaluating cross-sectional results. Although it may be premature to 'write off' the importance of cross-sectional research, until we can accurately determine what cross-sectional studies are really telling us, and until we can demonstrate that they yield the same results as longitudinal studies, it would be far more profitable (albeit more costly and time consuming) to undertake more detailed longitudinal investigations of second language acquisition.

One of the assumptions of a cross-sectional study is that the slice one takes in the continuum will be a microcosm of the developmental process. As I suggested earlier in this paper, we do not know what the continuum looks like, and so we cannot be too confident that a single slice reflects the entire continuum. This study represents a comparison of one individual's rank orderings where we know that the cross-sectional slice represents 10 months of exposure. There is no reason to believe that 10 months is necessarily the most representative point to examine. Perhaps, if there is an ordered sequence among the morphemes, this slice caught the subject at a developmental transition point. To check the possibility that this particular slice was uniquely 'non-representative', I ranked the morphemes in each of the 10 tape sessions, omitting those morphemes with two or fewer obligatory occasions. Table XII indicates the ranks of the morphemes for each of the one month intervals. As can be seen, the rank orders of the morphemes appear to fluctuate from month to month. No cross-sectional point appears to resemble the longitudinal developmental order.

Table XII

Jorge's Morpheme Accuracy Rank Ordered at Each of 10 Monthly Points

Morphemes / Tape #	1	3	5	7	9	11	13	16	18	20
Copula	2	1	4	1	2	6	1	2	4	2
Art.	5	3	2	4	3	3	4	4	2	6
Sh. Pl.	7	2	1	3	1	4	3	5.5	6.5	5
Pro Case	6	5	3	2	5	2	2	1	3	4
Ing.	4	4		6	6	7	5	3	1	2
Aux (be)	1	6		7.5	7	10	6	5.5	5	2
L. Pl.					4	1		8		7.5
Past I.			7	9	8.5	8.5	9.5	7	8	9.5
Poss.	3		5	5		5	7			7.5
Past R.			6	7.5	10	8.5	9.5		6.5	9.5
3rd Reg.	8		8	10	8.5	11	8	9	9	11

Summary of Findings

Part I

1. While 'statistically' significant correlations were found between BSM-generated and spontaneous speech-based rank orders of morphemes for second language learners, and between the spontaneous speech-based order of morphemes for L_2 learners and the de Villiers' L_1 order of morphemes, due to large variability these correlations cannot be meaningfully interpreted.

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